

REMARKS

Reconsideration of the application, as amended, is respectfully requested.

I. STATUS OF THE CLAIMS

Claims 1-19 are currently pending. Claims 1, 5, 7, 12, 15 and 18 have been amended herewith to more particularly point out and distinctly claim that which Applicants regard as their invention. In particular, claims 1, 7 and 15 have been amended to further clarify that the plasma of the non-hydrogenous second gas consists of argon. In addition, claims 4, 11, and 17 have been canceled herewith without prejudice.

Support for the above amendments may be found throughout the specification as originally filed. In particular, support for the above amendments to claims 1, 7, and 15 can be found, for example, on pages 14-17 and in Figs. 7-9 of the present application. No new matter has been added by virtue of this amendment.

II. 35 U.S.C. 112, FIRST PARAGRAPH REJECTIONS

Claims 1-19 have been rejected under 35 U.S.C. 112, first paragraph as failing to comply with the best mode requirement on the grounds that according to the Examiner, the best mode of the removal of hydrogen using some kind of plasma having argon as a constituent is not disclosed in sufficient detail.

In response, Applicants disagree with the Examiners position. Applicants believe that the Examiner has failed to meet his burden of establishing that claims 1-19 do not comply with the best mode requirement under 35 U.S.C. 112, first paragraph.

However, in order to expedite the prosecution of the present application, claims 1, 7 and 15 have each been amended herewith to have the expression "to remove hydrogen from the processing chamber" removed from each these claims.

In view of the above actions taken, it is believed that the above rejection to claims 1-19 have been overcome and thus withdrawal of these rejections is requested.

III. EXAMINER'S COMMENT

It appears that the Examiner on page 3 of the instant Office Action has interpreted the term "a non-hydrogenous second gas" as recited in the pending claims as requiring a "gas mixture".

Applicants respectfully disagree with the above interpretation by the Examiner. Rather, the present specification does not limit the term "a non-hydrogenous second gas" as requiring a gas mixture. For example, in an exemplary embodiment within the scope of claims 1, 7 and 15 discussed on pages 14-17 and depicted in Figs. 7-9 of the present application, the non-hydrogenous second gas" is not a gas mixture but rather includes only argon.

Thus, for at least the above reasons, the term "a non-hydrogenous second gas" is clearly not limited to a gaseous mixture. It is further noted that the above-mentioned exemplary embodiment is provided by way of example only and in no way limits the scope of the present invention.

IV. 35 U.S.C. 103(a) REJECTIONS

(i) Claims 1-4, 7-9, 11 and 13-17 have been rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,649,082 to Hayasaka et al. ("the Hayasaka patent") in view of U.S. Patent No. 5,626,775 to Roberts et al. ("the Roberts patent").

(ii) Claims 5, 6, 10, 12, 18 and 19 have been rejected under 35 U.S.C. 103(a) as being obvious over Hayasaka in view of Roberts and in further view of U.S. Patent No. 5,660,682 to Zhao et al ("the Zhao patent").

In response, it is submitted that the combination of Hayasaka and Roberts fails to teach or suggest all the features recited in claims 1, 7 and 15 for at least the reasons set forth below.

As noted above, claims 1, 7 and 15 have been amended to further clarify that the plasma of the non-hydrogenous second gas consists of argon.

The Examiner concedes that Hayasaka fails to teach or suggest all of the features recited in claims 1, 7 and 15. In particular, the instant Office Action states that Hyasaka is silent regarding using a plasma of a non-hydrogenous second gas to clean the inner surfaces of a processing chamber. (See **page 4 of the instant Office Action**).

Moreover, Roberts fails to cure the deficiencies of the Hayaska reference because even if Hayasaka and Roberts were combined, this combination would still fail to teach or suggest all of the features recited in claims 1, 7 and 15. In particular, this combination of Haysaka and Roberts would at the very least fail to teach or suggest a method which included etching a processing chamber with a plasma of a non-hydrogeneous second gas consisting of argon, as required by claims 1, 7, and 15.

Specifically, Roberts does not teach or suggest a method which includes etching a processing chamber with a plasma of a non-hydrogeneous second gas consisting of argon, as recited in claims 1, 7 and 15. Claims 1, 7 and 15, as amended, use the language “consisting of” which indicates that the non-hydrogenous second gas used in these method claims only includes argon and consequently that the plasma of the non-hydrogeneous second gas only includes argon.

In contrast, Roberts does not teach or suggest using a plasma which only includes argon to etch a processing chamber as required by claims 1, 7 and 15. Rather, Roberts only discusses using argon as either a carrier gas for etching chemicals such trifluoroacetic acid and its various derivatives, or as a gas to be mixed with the etching chemicals to etch a processing chamber. (See Col. 5, lines 22-20 of Roberts). As can be gleaned from the above and from reading the Roberts reference, Roberts is completely silent regarding using a plasma which only includes argon to etch a processing chamber as required by claims 1, 7 and 15. One skilled in the art clearly understands that a plasma which includes only argon (claims 1, 7 and 15) is distinct with differing chemical properties from a plasma which includes argon and at least one or more etching chemicals as described in Roberts. Thus, Roberts fails to teach or suggest a method

which includes etching a processing chamber with a plasma of a non-hydrogeneous second gas consisting of argon, as recited in claims 1, 7 and 15.

Consequently, even if Hayasaka and Roberts were combined, this combination of Hayasaka and Roberts would at the very least fail to teach or suggest a method which included etching a processing chamber with a plasma of a non-hydrogeneous second gas consisting of argon, as recited in claims 1, 7 and 15.

Therefore, for at least the reasons set forth above, withdrawal of the above rejection to claims 1, 7 and 15 is requested. As claims 2 and 3 depend from claim 1, claims 8, 9, 13 and 14 depend from claim 7 and claims 16 depends from claim 15, withdrawal of the rejection to these dependent claims is likewise requested.

Next with regard to the rejections of claims 5, 6, 10, 12, 18 and 19 under 35 U.S.C. 103(a) as being unpatentable over Hayasaka in view of Roberts and further in view of Zhao, it is submitted that this combination fails to teach or suggest all of the features recited in these claims.

As discussed above with regard to claims 1, 7 and 15 above, Hayasaka and Roberts each at the very least fail to teach or suggest a method which includes etching a processing chamber with a plasma of a non-hydrogeneous second gas consisting of argon, as recited in claims 1, 7 and 15. As claims 5-6 depend from claim 1, claims 10 and 12 depend from claim 7 and claims 18 and 19 depend from claim 15, these dependent claims are likewise patentable over Hayasaka and Roberts alone or in combination for at least the reasons set forth above.

Furthermore, Zhao cannot cure the above deficiencies of the Hayasaka and Roberts references with regard to claims 5, 6, 10, 12, 18 and 19 because at the very least, Zhao expressly teaches away from providing a method which includes etching a processing chamber with a plasma of a non-hydrogeneous second gas consisting of argon, as required by claims 5, 6, 10, 12, 18 and 19. It is well established under the U.S. Patent laws, when a prior art reference teaches away or leads away from a claimed invention, obviousness may be rebutted. (See MPEP 2145).

Although Zhao mentions a plasma which includes only argon for cleaning integrated circuit devices, it does so only for the purposes of teaching away from the use of this type of plasma. Rather, Zhao teaches away by, for example, discussing what it perceives to be disadvantages associated with a plasma which includes only argon. (See Col. 1, lines 64-Col. 2, lines 1-27 and Col.3, lines 56-64 of Zhao). Moreover, none of the embodiments discussed in Zhao uses a plasma which includes only argon in the cleaning processes. Instead, Zhao describes that a plasma which includes both argon and hydrogen should be used, rather than a plasma which includes only argon in its cleaning processes. (See Col. 3, lines 56-64 of Zhao).

Consequently, one skilled in the art viewing the Zhao reference would be led away from modifying the teachings of Hayasaka and Roberts to provide a method which included etching a processing chamber with a plasma of a non-hydrogeneous second gas consisting of argon, as required by claims 5, 6, 10, 12, 18 and 19. Thus, the teachings of the Zhao reference cannot cure the deficiencies of Hayasaka and Roberts.

In addition to the reasons given above, Zhao's teachings are further deficient in that Zhao teachings are limited to cleaning integrated circuit devices in a processing chamber. However, Zhao is completely silent regarding etching a process chamber with a plasma after a semiconductor substrate has been removed from the processing chamber as required by claims 5, 6, 10, 12, 18 and 19.

Therefore, for at least the reasons set forth above, Zhao cannot cure the deficiencies of the Hayasaka and Roberts because at the very least Zhao's teaching are insufficient for guiding one skilled in the art to provide a method which includes etching a processing chamber with a plasma of a non-hydrogeneous second gas consisting of argon, as required by claims 5, 6, 10, 12, 18 and 19. Accordingly, even if Zhao were combined with Hayasaka and Roberts, this combination would still at the very least fail to teach or suggest a method which included etching a processing chamber with a plasma of a non-hydrogeneous second gas consisting of argon, as recited in claims 1, 7 and 15.

Withdrawal of the above rejections to claims 5, 6, 10, 12, 18 and 19 is requested.

V. CONCLUSION:

For the foregoing reasons, the present application, including claims 1-3, 5-10, 12-16 and 18-19, are believed to be in condition for allowance.

The Examiner's early and favorable action is requested. The Examiner is invited to contact the undersigned if he has any questions or comments in this matter.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Scott L. Appelbaum", written over a horizontal line.

Scott L. Appelbaum
Reg. No. 41,587
Attorney for Applicant

F. Chau & Associates, LLC
130 Woodbury Road
Woodbury, NY 11797
Tel: (516) 692-8888
Fax: (516) 692-8889